2019 Impact Case:
Energy transitions with and for society in Hong Kong and the Asian Region
By
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One of the small group discussion session in Fairview Park Solar Community Workshop in March 2019.

Full house of about 30 residents joined the Hong Lok Yuen Solar Community Workshop in June 2019.

Site visitation to one of the solar school during the Solar School Workshop in June 2019.

(1) Summary of the impact

This Impact Case has evolved from a cluster of policy-oriented and public-engaged projects led by an interdisciplinary team in Asian Energy Studies Centre (AESC). In *Hong Kong*, the research on engaging society for sustainable energy futures has been impactful in (i) influencing policy changes in relation to renewable energy developments, (ii) informing Greenpeace's energy campaigns strategies; (iii) catalyzing solar schools, (iv) promoting community initiatives on urban solar; (v) enhance energy citizenship and energy literacy. In *Asia*, the research informed community solar leaders in Seoul to use our research findings and good practices in Hong Kong to target policy changes.

(2) Underpinning research

AESC has developed a sustained research on the theme of energy transitions with and for society, with a focus on engaging the public in the context of energy and with the broader implications to the Asian region. AESC's *interdisciplinary* research is based on a team with highly diverse and complementary expertise: Energy transitions governance and policy (Mah), climate governance (Lo), and climatology (Chun).

The main research of AESC is funded by various external grants (including ECS/GRFs and PPR), contract projects funded by Greenpeace, and internal grants. The major ones include:

2.1. GRF funded *Energy transitions and trust in Asia* (HK$1.3 million; 2017-2020; Mah (PI))

2.2. RGC's Early Career Scheme, Engaging consumers for low-carbon future in Asia (HK$619,000; 2014-2017; Mah (PI))

2.3. CLP contract research *Rooftop solar potential in HK* (HK$150,000; 2015-2016; Mah (co-PI), Lo (co-I))

2.4. Greenpeace/ WWF contract research: *Attitudes and perceived barriers to solar policies – Renewable Feed-in tariff.* (HK$200,000; 2016-2017; Mah (PI), Lo (co-I))

2.5. Greenpeace contract research *Solar schools in HK – potentials and challenges* (HK$135,000; 2018; PI: Mah; Co-I: Lo)

2.6. HK Government-Public Policy Research Funding Scheme Engaging the community for energy futures: solar communities. (HK$632,500; 2018-2019; Mah (PI), Lo (co-I)

2.7. BU funded. *HK online solar map – A GIS web implication for rooftop PVs*. (HK$80,000; 2016-2017; PI: Lo; Co-I: Mah).

Research contribution. AESC research has examined governance challenges for energy transitions (including solar deployment) in Hong Kong and other global megacities including Seoul, Singapore, London, and New York City. Our major contributions include: (1) we have developed several frameworks which shed light on engaging the public in energy transitions from complementary aspects which include (i) public perceptions [3.5], (ii) an enabling framework for rooftop solar photovoltaic (PV) deployment [3.3], and (iii) an evaluative framework for the effectiveness of public participation [3.1]; (2) AESC research has filled in an important knowledge gap in energy transition studies: the *social and human* aspects - we have conceptualised and improved the clarity of the typologies of barriers (economic, technological, market, institutional, regulatory, and social factors) to solar adoption, and the *varieties* of responses across adopters' sectors (individual households, businesses, and the public sector)[3.3, 3.4]. Our research also sheds light on the critical social issues of energy transitions, including energy equity and energy poverty [3.3]; (3) we provide research-based policy analysis and policy recommendations: AESC research specifies *schools* and *communities* as two strategic sectors in Hong Kong that have substantial potential to develop solar, but solar resources were vastly under-used; (4) AESC research has a *regional* geographical scope through a number of collaborative projects with collaborators in South Korea, Japan, and China [2.1, 2.2. 2.6]. We have built important linkages between HK experience and other Asian cities (Seoul, Kyoto, Guangzhou, Foshan) in the broader Asian contexts [3.2, 3.5, 3.6]; and (5) research by Chun and Mah built the linkages between climate factors and household electricity consumption patterns.

(3) References to the research (indicative maximum of six references)

3.1. **Mah, D**., & Hills, P. (2014). Participatory governance for energy policy-making: A case study of the UK nuclear consultation in 2007. *Energy Policy, 74*, 340-351.

3.2. **Mah, D.,** & Hills, P. (2016). An international review of local governance for climate change: Implications for Hong Kong. *Local Environment, 21*(1), 39-64.

3.3. Mah, D., Wang, S. G., **Lo, K**., Leung, M. K. H., Hills, P., & Lo, A. Y. H. (2018). Barriers and policy enablers for solar PV in cities: Perspectives of potential adopters in Hong Kong. *Renewable and Sustainable Energy Reviews*. 92, 921-936.

3.4. Lo, K., Mah, D., Wang, G., Leung, M. K. H., Lo, A. Y., & Hills, P. (2018). Barriers to adopting solar photovoltaic systems in Hong Kong. *Energy & Environment.* doi:10.1177/0958305X18757402

3.5. **Mah, D.**, Lam, V., Siu, A., Ye, H., Ogata, S., & Wu, Y.-Y. (2018). Understanding undergraduate students' perceptions of dynamic pricing policies: An exploratory study of two pilot deliberative pollings (DPs) in Guangzhou, China and Kyoto, Japan. *Journal of Cleaner Production,*

202, 160-173. doi:10.1016/j.jclepro.2018.07
3.6. **Mah, D.,** (2019). Community solar energy initiatives in urban energy transitions: A comparative study of Foshan, China and Seoul, South Korea. *Energy Research & Social Science, 50*, 129-142. doi:https://doi.org/10.1016/j.erss.2018.11.011

(4) Details of the impact (indicative maximum 750 words)

4.1. Hong Kong policy impacts

AESC research findings have led to policy shifts from a focus on cleaner fuels (the use of more gas and nuclear to replace coal) to a new policy orientation towards urban solar. The government has *introduced a major renewable energy policy, the renewable feed-in tariff* (REFIT subsidies), in October 2018. As of February 2019, about *1000 applications* of solar installation for the REFIT subsidies) have been made, implying that AESC research has contributed to a noticeable number of new solar projects which are expected to be built in Hong Kong.

Research findings from our project on potential of rooftop solar in HK and solar policies in HK (including REFIT) informed the policy-makings and major stakeholders (including the two monopolised power companies, green groups, and Heung Yee Kuk) regarding the (i) solar potential and the extent of solar resources which have been underused; (ii) stakeholders' perceived barriers to solar adoptions; (iii) public preferences to solar policies, including REFIT. Knowledge transfer was made through (i) a number of internal meetings between the AESC and the Environment Bureau, other relevant government departments and governmental advisory bodies; (ii) press conference co-organised with Greenpeace); (iii) media coverage; and (iv) public seminars.

AESC research findings were directly drawn upon by the Chief Executive's 2018 Policy Address (Oct 2018) which states that *"the promotion of renewable energy is an integral part of mitigating climate change… we have introduced* ***Feed-in Tariff*** *to provide incentives… In addition, we will introduce a new programme to* ***assist schools****… in installing renewable…".*

An email addressed directly to Mah was sent by the Environment Bureau Chief Wong Kam-sing dated 10 Oct 2018, the same date when the Chief Executive announced the Policy Address, in which Wong noted the inputs of AESC: *"We have listened to your views… This year, we have prioritized climate change in our work. The provision of your excellent views have offered us solid basis for our new policy measures introduced in this Policy Address. I thank you sincerely*."

4.2. Impacts on solar schools

AESC's study on solar school contracted by Greenpeace offered evidenced-based policy recommendation to the government: We recommended the government to provide a one-stop service for prospective solar schools. This recommendation was directly drawn upon by the government's *Solar Harvest* solar school initiative launched in Feb 2019. *Solar Harvest* offers a one-stop service from solar assessment, to feasibility technical study, to system design and installation to prospective solar schools in HK. The government has planned to help 50+ solar schools (the first batch of the initiative) to install solar during summer of 2019.

AESC's *Hong Kong Solar Partnership* has played an instrumental role in the design of the Solar Harvest programme. The Solar School Working Group under the Partnership held its first meeting in Nov 2018, in which core members from schools and AESC research team shared policy recommendations with a representative from the government. A half-day workshop was organized in Jun 2019 for solar and non-solar school teachers to exchange experience and views on Solar Harvest and renewable energy education.

The first working group meeting of Hong Kong Solar Partnership.

4.3. Impacts on informing Greenpeace's campaign strategies and empowering NGOs

Greenpeace's climate and energy campaign strategies in 2017-2019 relied on AESC's research findings on solar resources, and their perceived barriers. Our findings were drawn directly by Greenpeace' solar school campaign in which they targeted schools as a key sector for solar deployment. AESC co-organised *a press conference* with Greenpeace, which attracted extensive media coverage. AESC also co-joined a number of internal meetings (4.1) with key energy policy-makers and stakeholders (stated above). This kind of academic-NGO collaboration has enhanced the credibility of NGOs' work and strengthened their influence on policy-makers. AESC research also influenced other NGOs including WWF, 350 HK and Oxfam through our other contract studies.

4.4. Impacts on solar communities

AESC research, in particular the three renewable/ solar deliberative workshops, contributed to improvement in understanding of issues surrounding the use of renewable energy in HK among over 150 participants from local communities, enhanced their energy literacy, and influenced their attitude towards energy transition. Upon being informed by our recommendations in our workshops, a resident at a local residential community, Fairview Park, one of the most important prospective solar communities in HK where 5,000 semi-detached houses are located, petitioned for his management company to allow installation of solar panels on rooftops of houses in 2017. The management company subsequently issued an *"Application Form for Installation of Solar Panel"* (5.4) in late 2017. The resident also mobilised ten other neighbours to conduct solar assessments of their rooftops, indicating their interest in installing PV systems. We worked with CityU's team to provide free onsite solar assessment for this group of residents. AESC also facilitated a first meeting between these residents, the management company, the utility, and other key stakeholders in April 2018. Following that meeting, it was evident that the management company considered the residents' feedback and in response issued a revised Application Form for Installation of Solar Panel in May 2018 which loosened the scale limitations of solar panels (from "4m^2 maximum" to no specific maximum size). As of Jan 2019, 21 solar household applications were submitted to the management company, with 16 approved. AESC has utiltised the Fairview Park as a case of good practice, and has transferred the good practice to other prospective solar communities in HK (e.g. Hong Lok Yuen) and other Asian cities (e.g. Seoul). In addition, the government also drew upon the AESC's policy recommendation, and introduced *a relaxation on the height limits* of rooftop solar projects in village houses (5.4). As of Feb 2019, about 1000 applications have been made for the REFIT subsidies, in which a majority comes from village houseowners. Two Solar Community Workshops were also held in Mar and Jun 2019 to facilitate dialogue on renewable energy deployment within the prospective solar communities.

Expert answered questions from resident in the Fairview Park Solar Community Workshop.

Residents from Hong Lok Yuen exchange views on solar technology during the Workshop.

4.5. Enhanced energy literary, and informed dialogues on complex energy matters in HK and other Asia cities including Kyoto and Guangzhou

AESC research has contributed to enhancing energy literacy in Hong Kong and promoting rational debates about local energy options and transitions. In 2017 and 2018, three deliberative workshops on REFIT, solar developments, and solar schools, with 150+ participants. Some of the participants were local residents of key prospective solar communities (e.g. a participant was a member of the Resident Advisory Group of Fairview Park and he directly made recommendations on solar to the management company which subsequently issued a Solar Application Form to formalize residents' applications for installing solar systems. Some participants were active in joining the Whatsapp groups for solar with fellow residents). Our impact on enhancing energy literacy extended to other Asian cities, including Guangzhou and Kyoto, mainly through our two pilot DPs held there [3.5].

4.6. Asian/ regional policy impacts

AESC has focused on knowledge exchange with other Asian cities, in particular Seoul. Our project co-I, Mrs. Kim So-young has established network with about 100 energy self-reliant villages. She will share and use AESC research findings to target their community-led effort on driving policy and regulatory changes.

4.7. Public outreach

AESC's public outreach has been extensive: (i) media coverage: local media reports of the research with Mah and Lo interviewed for South China Morning Post, Radio Television Hong Kong, and other major mass media; (ii) Between 2017-2019, Mah and Lo gave 10+ seminars/ talks to non-academic audience: (seminar to BEC, HYK, industrial practitioners); (iii) online solar map: our HK Solar Map launched in November 2016 **[3.3]** is an asset for society and contributes to citizen empowerment as it allows anyone with Internet access to select areas in HK and estimate the solar capacity plus the potential financial implications of installing a PV system at the selected area; as of 21 May 2018, the site had been accessed 6,233 times; (iv) AESC has been utilizing a range of online and offline platforms to share our research updates and findings. Since its launch in November 2014, our Youtube channel had uploaded 55 videos, received 3,044 views, and the watch time totaled 9,583 minutes (33% is from inside HK and the rest is from overseas).

(5) Sources to corroborate the impact (indicative maximum of 10 references)

5.1. Chief Executive's 2018 Policy Address: https://www.policyaddress.gov.hk/2018/eng/index.html; 5.2. Greenpeace press release of Solar School: http://www.greenpeace.org/hk/press/releases/climate-energy/2018/10/solar-school/; 5.3. Solar Harvest". EMSD has set up a website: https://re.emsd.gov.hk/english/gen/4S/4S.html; 5.4. "Application Form for Installation of Solar Panel" issued by the Management Company of Fairview Park" in 2018; 5.5. The government's relaxation

on the height limits of rooftop solar projects in village houses; 5.6. Hong Kong Online Solar Map: http://digital.lib.hkbu.edu.hk/solarmap/; 5.7. Information Note: Legislative Council, HKSAR Government: https://goo.gl/C5pmpP; 5.8. Testimonies from (i) Greenpeace, (ii) school association; (iii) a local resident in Fairview Park; (iv) from Kim So-young, a solar community leader in Seoul and a co-chair of a solar community network in South Korea; 5.9. AESC's knowledge exchange activities, including media interview, deliberative workshops, conferences and seminars: http://aesc.hkbu.edu.hk/knowledge-exchange.